

BLOOD SPATTER EVIDENCE

How can it be determined that the Sheppard killer was left-handed and not right-handed? What about the bloodstains indicated this?

The patterns left by falling, projected, or smeared blood can help the forensic investigator interpret and reconstruct what has happened at a crime scene. Blood spatter patterns are often used to prove or disprove the suspect's account of what happened. Careful observation of the position and shape of stain patterns can give information such as the direction of travel, the angle of impact, the position of origin, and the blood droplet's speed at the time of impact.

Key terms that can be used to describe bloodstains in subsequent exercises include:

Angle of impact: The acute angle formed between the direction of a blood drop and the plane of the surface it strikes

Arterial spurting (or gushing) pattern: Bloodstain pattern(s) resulting from blood exiting the body under pressure from a breached artery

Back spatter: Blood directed back toward the source of energy or force that caused the spatter

Blood spatter analysis: A field of forensic science that deals with the physical properties of blood and the patterns produced under different conditions as a result of various forces applied to the source of blood

Bloodstain: Evidence that liquid blood has come into contact with a surface

Cast-off pattern: A bloodstain pattern created when blood is released or thrown from a moving blood-bearing object

Contact stain: Blood deposited from direct contact between two surfaces, at least one of which is bloody

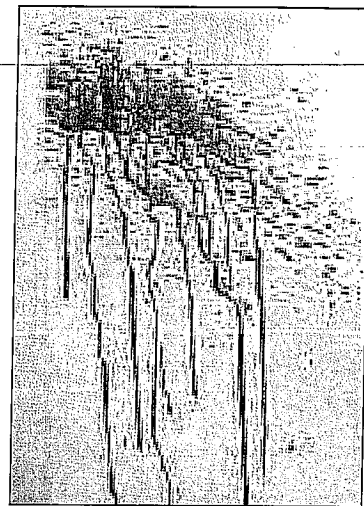
Direction of flight: The trajectory of a blood drop, which can be established by its angle of impact and directionality angle

Directionality: The directionality of a bloodstain or pattern that indicates the direction the blood was traveling when it hit the target surface; investigators can usually establish directionality of a blood drop's flight from the geometric shape of its bloodstain

Directionality angle: The angle between the long axis of a bloodstain and a predetermined line on the plane of the target surface that represents 0 degrees

Draw-back effect: Blood in the barrel of a firearm that has been drawn backward into the muzzle

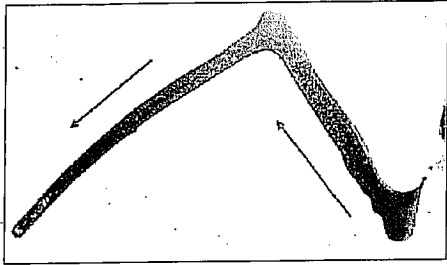
Drip pattern: A bloodstain pattern that results from blood dripping into blood



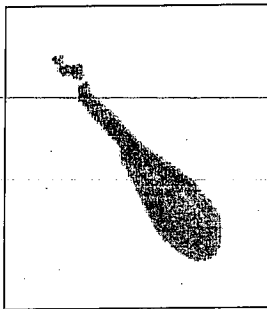
Arterial spurting



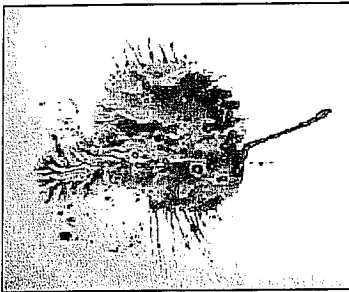
Contact stain—footwear



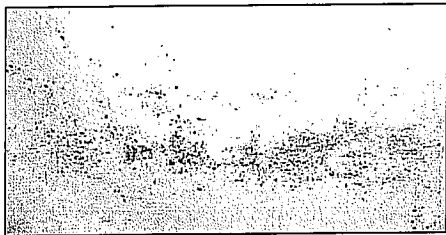
Flow pattern



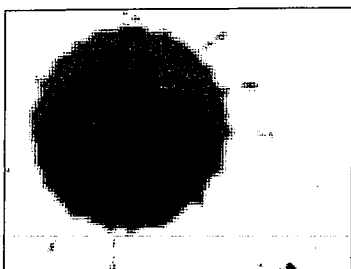
Forward spatter



Low-velocity impact spatter



Medium-velocity impact spatter



Passive drop

Expirated blood: Blood that is blown out of the nose, mouth, or a wound as a result of air pressure or air flow, which is the propelling force

Flight path: The path of the blood drop as it moves through space, from the impact site to the target

Flow pattern: A change in the shape and direction of a bloodstain due to the influence of gravity or movement of the object

Forward spatter: Blood that travels in the same direction as the source of energy or force that caused the spatter

High-velocity impact spatter (HVIS): A bloodstain pattern caused by a high-speed impact or force to a blood source such as that produced by gunshot; velocity may be 100 ft/sec, generally forming drops ≤ 1 mm

Impact pattern: Bloodstain pattern created when blood receives a blow or force resulting in the random dispersion of smaller drips of blood

Impact site: That point where force meets a blood source

Low-velocity impact spatter (LVIS): A bloodstain pattern caused by a low-speed impact or force to a blood source; velocity may be up to about 5 ft/sec with drop size of 4 to 6 mm

Medium-velocity impact spatter (MVIS): A bloodstain pattern caused by a medium-speed impact or force to a blood source; a beating or stabbing typically causes this type of spatter, and velocity may be about 25 ft/sec with a stain generally of 1 to 4 mm

Misting: Blood that has been reduced to a fine spray as a result of the energy or force applied to it

Parent drop: A drop of blood that casts off a wave or satellite spatter

Passive drop (bleeding): Bloodstain drop(s) created or formed by the force of gravity acting alone

Point (area) of convergence: The common point (area), on a two-dimensional surface, over which the directionality of several blood drops can be retraced

Point (area) of origin: The common point (area) in a three-dimensional space to which the trajectories of several blood drops can be retraced

Projected blood pattern: A bloodstain pattern produced by blood released under pressure, as opposed to an impact, such as arterial spurting

Satellite spatter: Small droplets of blood distributed around a drop or pool of blood as a result of the blood hitting the target surface

Spatter: Blood that has been dispersed as a result of force applied to its source; a spatter pattern will vary depending on the force that created it

Spine: The pointed or elongated stains that radiate from the central area of a bloodstain

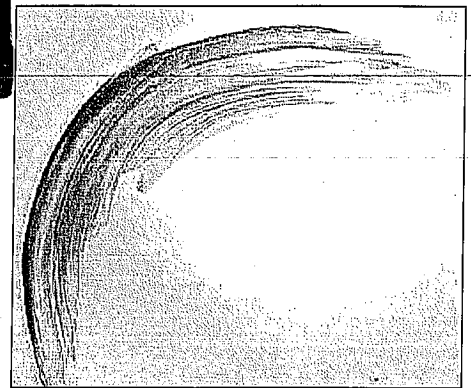
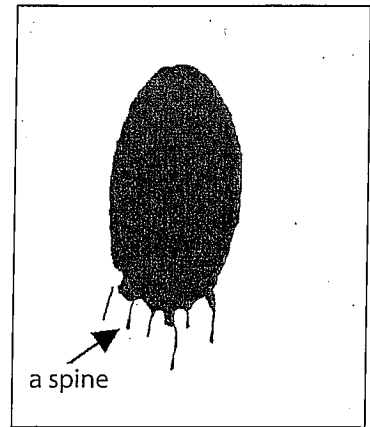
Swipe pattern: The transfer of blood from a moving source onto an unstained surface; the direction of travel may be determined by the feathered edge

Target: The surface on which blood has been deposited

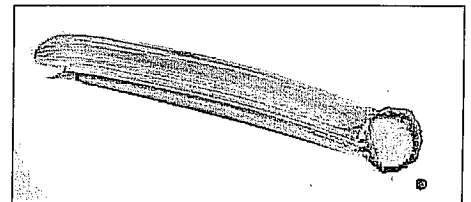
Transfer or contact pattern: A bloodstain pattern created when a wet, bloody surface comes in contact with a second surface; a recognizable image of all or a portion of the original surface may be observed in the pattern

Void: An absence of stains in an otherwise continuous bloodstain pattern, like a reverse shadow

Wipe pattern: A bloodstain pattern created when an object moves through an existing stain, removing it or changing its appearance



Swipe pattern



Wipe pattern